SUPPLY, OVERHAUL, TESTING, CALIBRATION AND COMMISSIONING OF TRACTION MOTOR TEST BENCH AND ASSOCIATED EQUIPMENT FOR ROTATING MACHINE BUSINESS.

ROTATING MACHINE DEPOT, 150 EEL ROAD, UMBILO.

REFERENCE No: OPS_RM_DBN_ESR_SOW_143

DATE OF RELEASE: JULY 2023

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Signature of Bidder/s: _____ Date: _____

DOCUMENT AUTHORITIES

Department	Facilities and Infrastructure
Department Affected	Rotating Machines Business
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Signature & Date	26/02/2024

Signature of Bidder/s: _____ Date: _____

1. INTRODUCTION / SCOPE of Work

This specification is for the:

#	TASK	REQUIRED
1	Design	
2	Manufacture	
4	Foundations	
5	Supply	✓
6	Repair	✓
7	Replacement	✓
8	Documentation	✓
9	Testing	✓
10	Training	✓
11	Commissioning	✓

of the specified:

#	ITEM	REQUIRED
1	Supply, repair, testing, calibration and commissioning of the existing Traction motor test bench and associated equipment for Rotating Machine Business.	✓
2	Training for 5 Transnet Engineering staff members on how to operate, maintain and service the test bench.	✓
3	Submission of project completion documents.	✓

2. SITE INSPECTION

2.1 All prospective contractors shall be required to undertake a compulsory site inspection to fully acquaint themselves with all aspects involved.

2.2 Arrangements to visit the site and confirmation of the date and time of the site inspection shall be made with Transnet Engineering Contract Manager.

2.3 The site inspection certificate shall be completed and countersigned by the Contract Manager on the day of the the visit and must be submitted with the tender documents.

3. INFORMATION REQUIRED

3.1 Offers will not be considered unless full particulars and sufficient literature are provided at the tendering stage to enable Transnet Engineering Technical Officers the opportunity to assess each technical offer properly.

3.2 Prospective Contractors will complete the relevant questionnaire in full and must indicate whether their offer complies with each item of the specification

3.3 Should there be insufficient space for furnishing full details; contractors shall provide the additional details in their covering letter. The additional details shall be numbered in accordance with the applicable clause specified in the specification.

3.4 As prospective contractors are considered to be experts in their field, they are obliged to identify any shortcomings, such as omissions or sub-standard requirements, to the completeness of this specification. These must be brought to the attention of Transnet Engineering at tender stage with alternatives to address these shortcomings. However, each offer shall be quoted for separately.

Signature of Bidder/s: _____ Date: _____

4. TECHNICAL REQUIREMENTS

The following legislation and code (including all relevant legislations and codes) all relevant codes must be complied with:-

- The Occupational Health and Safety Act – Act 85 of 1993.
- SANS 10142 **:**The wiring of premises Part 1: Low-voltage installations.

4.1 Except where otherwise provided for in the specification, all equipment offered will comply with the requirements of the relevant standard specifications of the SABS, if published, otherwise with the relevant standard of the British Standards Institution in force at the time of tendering.

4.2 Where equipment offered complies with the recognized standards of the country of manufacture and not specifically with the standards required by this specification, such equipment will be considered at the discretion of Management. In this case, tenders shall state fully all respects in which the equipment departs from the standard laid down in this specification.

4.3 The successful tender will at the conclusion of the installation provide a document along the lines "that the installation complies with national/international requirements and that all selected /designed items are compliant with Act 85 of 1995 and SABS practices applicable to the installation. The equipment has been commissioned/ calibrated and employees as specified have been trained and found competent to operate the plant."

5. SPECIFIC REQUIREMENTS

Any person with the intention of tendering for this job shall ensure that the information below is complied with.

5.1 Scope of work

ITEM	This scope of work document covers the minimum requirements
5.1.1	This scope of work document covers the minimum requirements
5.1.1.1	This scope of work shall be read with Annexure 1 (Transnet Engineering Safety, Health and Environmental Management specification) and contractor management SOP 014. • Bidders shall include costs of Health, Safety and Environmental Management compliance.
5.1.1.2	The successful contractor may use the alternative components and systems to overhaul the traction motor test bench, if the existing components and systems are obsolete.
5.1.1.3	Supply, overhaul, testing, calibration and commissioning of the Traction motor Test bench for Rotating Machine Business.
5.1.2	**Traction motor Test bay**
5.1.2.1	A new SCADA system must be supplied and fitted in to the test bay. It must have suitable key lock out or Pass word lock to ensure only authorized personnel operate.
5.1.2.2	The system works on the principle of the Hopkinson back to back load test.
5.1.2.3	It must be linked to a computer system supplied by Transnet. On which the software must be loaded.
5.1.2.4	A new Electric Control Panel must be supplied and fitted to support the full load.

Signature of Bidder/s: _____ Date: _____

<table>
<tr><th>ITEM</th><th>This scope of work document covers the minimum requirements</th></tr>
<tr><td>5.1.2.5</td><td>The power circuit requires three off 800amp AC contactors with 220V coils to be fitted into the control panel that will be used to power the Elin motor. Type: Schneider Compact NS800N.</td></tr>
<tr><td>5.1.2.6</td><td>A main isolator rated 600amps must be supplied and fitted. OT Pole Base Mounting Switch Disconnector - 800A Maximum Current.</td></tr>
<tr><td>5.1.2.7</td><td>Overvoltage regulator must be supplied and fitted</td></tr>
<tr><td>5.1.2.8</td><td>3 x 220V contactors, 20amps must be supplied and fitted into panel.</td></tr>
<tr><td>5.1.2.9</td><td>Three off digital gauges must be supplied and fitted with current transformers to measure up to 800amps. Digital Ammeters with Current transformers.</td></tr>
<tr><td>5.1.2.10</td><td>A start, stop button and emergency stop must be supplied and fitted. Type Schneider.</td></tr>
<tr><td>5.1.2.11</td><td>The SCADA must control the input voltage and current from 0Volts to 1500Volts DC and the excitation voltage from 0 -100Volts DC.</td></tr>
<tr><td>5.1.2.12</td><td>The duration of test is one hour.</td></tr>
<tr><td>5.1.2.13</td><td>The following parameters will be measured and recorded during the test process and must be displayed on the screen.</td></tr>
<tr><td>5.2.14</td><td>
<table>
<tr><th>No</th><th>Parameters</th><th>Input</th><th>Motor A</th><th>Motor B</th><th>Booster</th><th>QTY</th></tr>
<tr><td>1</td><td>Voltage</td><td>1000V</td><td>1500V</td><td>1500V</td><td>1000V</td><td>4</td></tr>
<tr><td>2</td><td>Current</td><td>800A</td><td>600A</td><td>600A</td><td>600A</td><td>4</td></tr>
<tr><td>3</td><td>Temperature</td><td>150d/c</td><td>150d/c</td><td>150d/c</td><td>150d/c</td><td>4</td></tr>
<tr><td>4</td><td>Speed</td><td>3500rpm</td><td>3500rpm</td><td>3500rpm</td><td>3500rpm</td><td>4</td></tr>
</table>
</td></tr>
<tr><td>5.2.15</td><td>The following machinery and equipment must be repaired, i.e. rewind, VPI , replacement of bearings and brushes, static and load tested, supplied and fitted to minimum requirements</td></tr>
<tr><td>5.2.16</td><td>The Elin motor that drives the 6e1 traction motor.</td></tr>
<tr><td>5.2.17</td><td>Power – 80Kw, Voltage – 380V – AC, Current – 160A</td></tr>
<tr><td>5.2.18</td><td>Full rewind, VPI, replacement of brushes and bearings.</td></tr>
<tr><td>5.2.19</td><td>Static and Load Test</td></tr>
<tr><td>5.2.20</td><td>The Elin Generator that excites the 6e1 Traction motor</td></tr>
<tr><td>5.2.21</td><td>Power – 70 Kw, Voltage - 230 V, Current – 300A</td></tr>
<tr><td>5.2.22</td><td>Full rewind, VPI, replacement of brushes and bearings</td></tr>
<tr><td>5.2.23</td><td>Static and Load Test</td></tr>
<tr><td>5.2.24</td><td>Booster drive motor</td></tr>
<tr><td>5.2.25</td><td>Power – 25Kw, Voltage – 380V, Current – 50A</td></tr>
<tr><td>5.2.26</td><td>Full rewind, VPI, replacement of brushes and bearings</td></tr>
<tr><td>5.2.27</td><td>Static and Load Test.</td></tr>
<tr><td>5.2.28</td><td>Booster motor</td></tr>
<tr><td>5.2.29</td><td>Power – 50kw, 110v DC, 450A</td></tr>
</table>

Signature of Bidder/s: _____ Date: _____

5.2.30	Full rewind, VPI, replacement of brushes and bearings.
5.2.31	Static and Load Test.
5.2.32	Booster Motor Cooling Fan x 2 or Supply New Equivalent replacement
5.2.33	Power – 2 Kw, 380v, 4A
5.2.34	Full rewind, VPI, replacement of brushes and bearings.
5.2.35	Static and Load Test.
5.2.36	**Autotransformer**
5.2.37	Re-insulate, VPI , Test
5.2.38	Voltage - 400V
5.2.38	Current – 400A
5.2.39	**6e1 Traction motor**
5.2.40	Full rewind, VPI, replacement of brushes and bearings. Static and Load Test
7.1.13	The electrical installation shall be done and fully completed by an electrical contractor. On completion a certificate of compliance shall be issued in accordance with SANS 10142**.**
7.1.14	Replace all measuring instruments, test and calibrate. Submit the calibration certificate. **CALIBRATION CERTIFICATES** The equipment shall come with a valid calibration certificate. The calibration and issuing of certificates shall be in accordance with SANS 17025. The calibration certificate shall not be older than 1 month during the time of handover of tarpaulin testing equipment.
7.1.15	**Documentation:** 1 set of PDF Files in a disk and 3 sets of hard copies. • Operating Manual • Maintenance Manual. • Electrical Schematics. • Mechanical Drawings. • Parts List.
7.1.16	On handover, the traction motor test bench and associated equipment shall be fully (100%) functional and be able to meet all set criteria.
7.1.17	Transnet reserves the right to invite the bidders to give presentations on their products, services and/or pricing.

5.1 Site

- The work shall be done at Rotating Machines Depot, 150 Eel Road, Umbilo.

5.2 Markings

- All labels and markings shall be indelible and only removable by deliberate intent.

5.3 Safety Features

- The equipment shall have a fail to safety protection system.

5.4 Testing

- All prescribed tests shall be carried out on equipment.
- Transnet also reserves the right to carry out any check tests on the equipment and installation.
- Notwithstanding the successful completion of tests, the contractor will still be responsible for the efficient operation of the equipment.

Signature of Bidder/s: _____ Date: _____

- Test certificates shall be submitted to Transnet Engineering.

5.5 Maintenance

- The maintenance plan shall be for 2 years. The tenderers shall include the maintenance plan. The quote for maintenance plan shall be added on the Schedule of prices.

5.6 Spares

- The successful tenderer shall supply Transnet Engineering with three sets of blown out diagrams and schematics of the complete machine as well as a detailed copies of the list of critical spares for all equipment including OEM numbers.
- The tenderers shall indicate the availability and required lead times for the spares considered to be critical for the successful operation of the equipment.

5.7 Warranty

- The contractor shall undertake to repair all faults due to bad workmanship and/or faulty materials during a period of 24 calendar months, calculated from the date that the completed plant installation is accepted by Transnet Engineering.
- Any latent defects that become apparent during the guarantee period shall be rectified to the satisfaction of Transnet Engineering at the cost of the supplier.
- The contractor shall undertake work on the rectification of any defects that may arise during the guarantee period within 7 days of being notified of such defects.
- **The warranty shall be 2 years.**
- **A maintenance contract for the warranty period shall be included in the quoted price and shall involve Transnet employees to learn.**

5.8 After-Sales Service

- The successful tenderer shall provide Transnet Engineering with acceptable proof that spares can be easily and speedily procured for the equipment within 7 working days through agents locally.

5.9 Commissioning

- **A testing period of 1 month (744 hours for 24/7 shifts and 248 hours for 8 hour shifts) this shall depend on what shift the business requiring the specified items.**
- **No equipment will be accepted by Transnet without the satisfaction of the conditions above.**

The following must be supplied on commissioning:

1 set of PDF Files in a disk and 3 sets of hard copies.

- Performance test certificate.
- Parts catalogue.
- Operator and maintenance staff training for a minimum of 5 people.
- All required software.
- Engineering drawings and blown out electrical/mechanical components drawings.
- Operating and maintenance manuals and parts catalogues shall be supplied.
- Maintenance schedule for all components shall be supplied

Note: All work to be completed in each respect by suitably qualified person.

Signature of Bidder/s: _____ Date: _____

6. CONSTRUCTION INDUSTRY DEVELOPMENT BOARD (CIDB) REGISTRATION

There is no CIDB requirement.

7. HEALTH AND SAFETY REQUIREMENTS

7.1 All repair work whether detailed in this scope of work or not shall comply with the requirements of the Occupational Health and Safety Act 85 of 1993 as amended and all other applicable legislation including specific set of regulations and local authority bylaws where applicable.

7.2 All the necessary safety equipment such as guards over rotating equipment shall be supplied and the equipment shall comply fully with all the requirements of the South African Occupational Health and Safety Act, Act 85 of 1993 and all other applicable legislation including specific set of regulations and local authority bylaws where applicable. At all times during the manufacture, assembly and testing of the equipment the contractor will be responsible for the safety of all persons on site and the equipment.

7.3 SHE SPECIFICATION

Prior to commencement of contract, the contractor shall be issued with a SHE specification in order to compile a SHE file in line with TE requirements. Prior to establishing on site, it is an explicit requirement of this contract that all of the Contractor's personnel directly involved with this contract, including those of sub-contractors, attend a **Safety induction course**.

Transnet will provide the course free of charge and attendance is compulsory for all personnel under the control of the Contractor who, during the duration of the contract, will be present on site whether on a full time or adhoc basis.

The contractor must allow for all additional charges because of these requirements as no claims for extras will be accepted in connection with the foregoing.

7.4 As part of the legislative and TE SHE requirements.

The successful contractor is required to conduct a Risk assessment to ascertain all potential risks associated with this project.

The completed risk assessment is to be formally submitted to the Risk department via the project manager at least two weeks prior to the commencement of the actual project. A safety file and associated documents will be required from a successful tenderer and such will be communicated by the Risk department.

8. SPECIALIST SUB-CONTRACTORS

8.1 Only specialist sub-contractors who have previously successfully completed work of the type and extent specified in this document should be engaged.

The tenderer shall provide the technical officer with sufficient proof of having suitable experience regarding the design and manufacturing of similar equipment. To this end, complete and detailed reference list shall be submitted with the tender. Reference list shall include addresses as well as

contact person who may be visited for inspection of the equipment during the adjudication period.

8.2 The tender shall submit a complete list of proposed sub-contractors and suppliers of major components with his tender.

8.3 The tenderer shall be prepared to commit themselves in writing to the technical officer with an adequate, experienced and stable project team for the duration of the contract.

8.4 Transnet Engineering will not consider any Tenderer's offer that, in the sole opinion of Transnet Engineering, does not have adequate experience in the design and manufacture of such equipment.

8.5 Contractors shall do the installation simultaneously with other contractors on-site busy with other work and shall plan work that it integrates with other work performed.

9. MATERIAL AND WORKMANSHIP

9.1 The materials shall be offered complete in all respects.

9.2 The materials, as made and supplied, shall be complete in every respect, of modern design, using the most advanced proven technology extensively supported by reputable local companies, and be built to good engineering practices. Tenderers shall supply a list of all the main components proposed as well as the addresses of the local support companies

9.3 All materials shall be adequately protected against damage and corrosion during shipping, transport and storage.

10. GENERAL REQUIREMENTS

Operation will be in the following conditions:

Altitude	Sea level
Ambient temperature	0˚C to 45˚C
Relative humidity	50% to 100%
Atmosphere	Heavy saline

10.1 Tenderers shall indicate clause-by-clause either that they comply in every respect with the specific requirements, or if not, exactly how it differs.

11. DEFINITIONS AND ABBERVIATIONS

CLIENT	Transnet Engineering Durban
TECHNICAL OFFICER	Project Manager, Transnet Engineering Durban
CONTRACTOR	Contractor appointed under this scope of work document
SABS	South African Bureau of Standards
SANS	South African National Standards

Signature of Bidder/s: _____ Date: _____

12. GENERAL

12.1 The successful tenderer will be subjected to a workshop inspection by Transnet Engineering, to ensure that the facilities are to the satisfaction of the Transnet Engineering in terms of the quality control and equipment capabilities for manufacturing such type of equipment.

12.2 The tenderers shall guarantee that the rating and size etc. of the equipment offered, will be adequate to perform the duties required.

13. SITE ESTABLISHMENT

13.1 The contractor shall be solely responsible for safety of his staff and for providing security to safeguard his works and material on site, until such a time.

13.2 The contractor shall be required to attend site meetings when convened by the Project Leader controlling the contract.

13.3 The contractor will be responsible for any damages caused by his staff to the building and civil works on site.

14. PENALTY CLAUSES

14.1 Due to the criticality of this project, penalties will be levied for late deliveries.

Signature of Bidder/s: _____ Date: _____

Signature of Bidder/s: _____ Date: _____